# AIX Operating System Commands Reference Volume 1

**Programming Family** 





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Portions of the code and documentation described in this book were developed at the Electrical Engineering and Computer Sciences Department at the Berkeley Campus of the University of California under the auspices of the Regents of the University of California.

The Rand MH Message Handling System was developed by the Rand Corporation and the University of California.

The Network File System was developed by Sun Microsystems, Inc.

This edition applies to Version 2.2 of the IBM AIX Operating System. Changes are made periodically to the information herein; these changes will be reported in technical newsletters or in new editions of this publication.

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# **About This Book**

This book contains reference information on Advanced Interactive Executive (AIX) Operating System commands. It describes the commands you can use and summarizes who can run them, how to run them, what they do, how they read input, how they write output, and how to modify their actions.

## Who Should Use This Book

To use this book, you should be familiar with AIX or UNIX System V commands. If you are not already familiar with AIX or UNIX System V, see Using the AIX Operating System. If you are familiar with the commands but need to review how to use the shell and write shell procedures, see "sh" on page 913.

## How To Use This Book

Most of the AIX commands described in this book are in alphabetical order by command name. Some related commands are combined in one description listed with a main or key command. The related commands have an entry with the main command in the table of contents and are listed individually in alphabetical order in the index. If you are having difficulty locating a particular command, check the "Contents" or "Index" sections of this publication.

## Command Information

The "Commands" section begins on page 11. A discussion of a command may include the following information:

A single-sentence description of the major function of each Purpose

command

A syntax diagram that shows command line options (For a Syntax

discussion of how to use this syntax diagram, see "Syntax

Diagrams" on page 5.)

Description A discussion of the command that provides more details about its

function and use

Flags A list of command line flags and associated parameters with an

explanation of how the flags modify the action of the command

Subcommands A list of subcommands (for interactive commands) that explains

their use

Examples Specific examples of how you can use the command

Files A list of files used by the command

Related Information A list of related commands in this book and related discussions in

other books.

For details on other conventions used in this book, see "How to Use the Commands" on page 3.

#### A Task Index

"Task Index" on page TASK-1 can help you locate the commands you need to perform specific tasks. It contains lists of commands grouped by task. Next to each command is a description of what it does. To find a command that performs a specific task, locate the task in the table of contexts at the beginning of the task index, go to the indicated page and review the list of commands associated with that task, then select the desired command. For more information about the command, refer to the discussion of the command in the "Commands" section.

## Other Reference Aids

A cross-reference listing of commands and program packages appears in Appendix B, "Program Cross-Reference" on page 1269. Appendix C, "Syntax Diagram Guide" on page 1277 contains a detailed description of how to read syntax diagrams. The standard system devices are described in Appendix A, "AIX Device Table" on page 1267. A "Glossary" of terms appears after the Appendixes, followed by an "Index."

In addition, a Reader's Comment Form and Book Evaluation Form are provided at the back of the second volume of this publication. Use the Reader's Comment Form at any time to give IBM information that may improve the book. After you have become familiar with the book, use the Book Evaluation Form to give IBM specific feedback about the book.

## Japanese Language Support

Appendix D, "Japanese Language Support" on page 1287 contains a list of commands that have not been modified to support Japanese characters.

## Special Key Sequences

You can use the AIX Operating System from any of several different display stations, each of which has a different keyboard. In some cases, you must press different keys to perform the same function from different keyboards. Throughout this publication both the function name (for example, INTERRUPT) and the necessary key sequence on the IBM RT system are identified. If you are not using an IBM RT Keyboard, look at your keyboard reference chart to find out which keys on your keyboard produce the same function.

## **Prerequisite Information**

- IBM RT Managing the AIX Operating System provides instructions for performing such system management tasks as adding and deleting user IDs, creating and mounting file systems, repairing file system damage, and managing data communications facilities.
- IBM RT Using the AIX Operating System describes using the AIX Operating System commands, working with file systems, developing shell procedures, and using data communications facilities.

## **Related Information**

- IBM RT AIX Operating System Programming Tools and Interfaces describes the programming environment of the AIX Operating System and includes information about using the operating system tools to develop, compile, and debug programs. In addition, this book describes the operating system services and how to take advantage of them in a program. This book also includes a diskette that includes programming examples, written in C language, to illustrate using system calls and subroutines in short, working programs. (Available optionally)
- IBM RT AIX Operating System Technical Reference is a four-volume set.

System Calls and Subroutines, describes the system calls and subroutines that a C programmer uses to write programs for the AIX Operating System.

Files and Extensions, contains information about the extensions to the kernel and base operating system, including file formats, special files, and GSL subroutines.

VRM Programming Support, describes the VRM programming environment, including the internal VRM routines, VRM floating-point support, use of the VRM debugger, and the supervisor call instructions that form the Virtual Machine Interface.

VRM Device Support, describes device IPL and configuration, minidisk management, the virtual terminal and block I/O subsystems, as well as the interfaces to VRM device driver and data link control components. This volume also describes the programming conventions for developing your own VRM code and installing it on the system. (Available optionally)

- IBM RT Using DOS Services provides step-by-step information for using AIX Operating System shell. (Available optionally; packaged with IBM RT DOS Services Reference)
- IBM RT DOS Services Reference provides reference information about the AIX Operating System shell. This book also includes information on sharing DOS files with Personal Computer AT Coprocessor Services, and on the differences between PC DOS and shell. (Available optionally; packaged with IBM RT Using DOS Services)
- IBM RT C Language Guide and Reference provides guide information for writing, compiling, and running C language programs and includes reference information about C language data structures, operators, expressions, and statements. (Available optionally)
- IBM RT Messages Reference lists messages displayed by the IBM RT and explains how to respond to the messages.
- IBM RT AIX Operating System Text Formatting Guide describes the functions and capabilities of NROFF and TROFF to perform text processing tasks. (Available optionally)
- IBM RT Bibliography and Master Index provides brief descriptive overviews of the books and tutorial program that support the IBM RT hardware and the AIX Operating System. In addition, this book contains an index to the RT and AIX Operating System library.

See IBM RT Bibliography and Master Index for order numbers of IBM RT publications and diskettes.

## **Ordering Additional Copies of This Book**

To order additional copies of this publication (without program diskettes), use either of the following sources:

- To order from your IBM representative, use Order Number SBOF-1814.
- To order from your IBM dealer, use Part Number 27F4354.

A binder is included with the order. For information on ordering the binder and manual separately, contact your IBM representative or your IBM dealer.

# Contents

VOLUME 1
How to Use the Commands
Command Input and Output
File Name Substitution
Syntax Diagrams
Command, Flag, and Parameter Notation
Commands
acct/*
chargefee
ckpacet
dodisk
lastlogin
monacet
nulladm
pretmp
prdaily
prtacet 10
remove 10
shutacct 16
startup 16
turnacct 16
acctems 18
acctcom 20
acctcon 24
acctcon1 24
acctcon2 25
acctdisk, acctdusg
acctmerg
acctprc 30
acctprc1 30
acctprc2
02
admin
40
anno 50

ap	53
ar	
arithmetic	
as	~ ~
at, batch	
audit	
auditappauditapp	
auditbin	
auditprauditpr	
auditselectauditselect	
auditstream	
auditwriteauditwrite	
awk	
back	
backup	
banner	94
basename, dirname	
bc	97
bdiffbdiff	102
bellmail	104
bffcreate	108
bfs	110
biod	114
biodd_cfg	115
bj	117
bs	118
burst	129
cal	132
calendar	134
cat	137
$\mathbf{cb}  \dots $	139
cc	140
cd	150
cdc	152
cflow	154
chgrp	156
chkcomp	158
chmod	160
chngstate	164
installe	166
updatec	167
chown	169
chparm	171
chroot	172
chtcb	174
clri	175

cmp	177
col	179
comb	181
comm	183
comp	185
confer	189
config	194
conflict	196
connect	198
ср	202
cpio	205
cpp	210
craps	214
crash	215
cron	220
crontab	222
csh	$\frac{222}{225}$
csplit	252
ct	254
ctab	$\frac{254}{257}$
ctags	
cu	263
cut	269
cvid	
Cvt	274
1 1	275
cxref	
1 (	281
dbx	284
	295
dcopy	299
dd	301
defkey	306
del	308
delta	310
deroff	313
devices	315
devnm	316
df	318
diff	320
diff3	323
diffmk	326
diremp	328
diskusg	330
display	332
list	336

	0.40
domainname	340
dos	341
dosdel	345
dosdir	346
dosread	348
doswrite	350
	352
dp	354
dsipc	
dsldxprof	355
dspcat	357
dspmsg	359
dsstate	361
dsxlate	363
du	364
dump	366
dumpfmt	368
echo	369
	371
ed	385
edconfig	
edit	387
env	393
eqn, neqn, checkeq	395
errdead	397
1	200
errdemon	398
errdemon	400
errpt, errpd	
errpt, errpd errstop	400 404
errpt, errpd	400 404 405
errpt, errpd	400 404 405 407
errpt, errpd errstop errupdate ex expr	400 404 405 407 412
errpt, errpd errstop errupdate ex expr factor	400 404 405 407 412 416
errpt, errpd errstop errupdate ex expr factor ff	400 404 405 407 412 416 417
errpt, errpd errstop errupdate ex expr factor ff	400 404 405 407 412 416 417 420
errpt, errpd errstop errupdate ex expr factor ff file find	400 404 405 407 412 416 417 420 422
errpt, errpd errstop errupdate ex expr factor ff file find fish	400 404 405 407 412 416 417 420 422 427
errpt, errpd errstop errupdate ex expr factor ff file find	400 404 405 407 412 416 417 420 422
errpt, errpd errstop errupdate ex expr factor ff file find fish	400 404 405 407 412 416 417 420 422 427
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder	400 404 405 407 412 416 417 420 422 427 428
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders	400 404 405 407 412 416 417 420 422 427 428 429
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format	400 404 405 407 412 416 417 420 422 427 428 429 433
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw fptype	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw fptype fsck, dfsck	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438 444
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw fptype fsck, dfsck fsdb	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438 444 445
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw fptype fsck, dfsck fsdb fuser	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438 444 445 450 455
errpt, errpd errstop errupdate ex expr factor ff file find fish fmt folder folders format fortune forw fptype fsck, dfsck fsdb	400 404 405 407 412 416 417 420 422 427 428 429 433 436 437 438 444 445

wtmpfix	458
	460
1 1	460
	$\frac{460}{461}$
	461
	461
	461
ged	463
gencat	470
gend	475
	477
	485
	488
	490
	494
	497
greek	499
grep	501
groups	506
4.07	508
¥ 4	509
	509
1	
	510
	510
	510
	510
quit {	510
remcom	510
7 49	511
	511
	512
	513
	514
	516
	517
	518
init [	521
install ह	524
	527
. 11	529
	331
•	532
•	
	33
ckprereq	33
	534
perm 5	37

ipcs	
ipctable	
istat	. 545
join	. 547
keyboard	
kill	
killall	
ld	
lex	
li	
line	
link, unlink	. 575
lint	. 577
ln	
locator	
login	
loginx	
logname	
logout	
lorder	
lp	
ls	. 595
VOLUME 2	601
VOLUME 2	601
,	
m4	. 603
m4	. 603
m4	. 603 . 608 . 623
m4	. 603 . 608 . 623 . 625
m4	. 603 . 608 . 623 . 625 . 632
m4	. 603 . 608 . 623 . 625 . 632 . 634
m4	. 603 . 608 . 623 . 625 . 632 . 634 . 635
m4 mail, Mail mailstats make makedbm makekey	. 603 . 608 . 623 . 625 . 632 . 634
m4 mail, Mail mailstats make makedbm makekey man mark	. 603 . 608 . 623 . 625 . 632 . 634 . 635
m4 mail, Mail mailstats make makedbm makekey man mark mark	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 648
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 648
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs mkdir	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 648 . 650 . 651
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs mkdir mkfs	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 648 . 650 . 651 . 657
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs mkdir mkfs mknod	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 650 . 651 . 657 . 658
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs mkdir mkfs	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 650 . 651 . 657 . 658 . 661
m4 mail, Mail mailstats make makedbm makekey man mark mdrc mesg mhl mhmail mhpath minidisks mkcatdefs mkdir mkfs mknod	. 603 . 608 . 623 . 625 . 632 . 634 . 635 . 637 . 640 . 642 . 643 . 646 . 650 . 651 . 657 . 658 . 661

mount	669
mountd	674
msgchk	675
msh	677
mv	679
mvdir	682
ncheck	683
ndtable	685
newform	686
newgrp	689
news	691
next	694
nfsd	696
nfsstat	697
nice	699
nl	701
nm	705
nohup	707
nroff, troff	709
number	721
od	723
on	726
open	728
pack	730
pcat	731
unpack	731
packf	733
passwd	735
paste	736
penfs	739
pdisable, phold	741
pg	744
pick	748
piobe	753
portmap	757
post	758
pr	761
prev	765
print	767
prof	773
profiler	775
prfld	776
prfstat	776
prfdc, prfsnap	776
prfpr	776
prompter	778

proto	780
prs	781
ps	786
pstart, penable, pshare, pdelay	791
ptx	794
puttext	796
pwck	798
pwd	800
pwtable	801
gdaemon	802
quiz	803
rc	806
rcvdist	808
rcvpack	810
rcystore	812
revtty	815
refile	817
regcmp	820
repl	821
restore	826
rexd	832
rm	833
rmail	836
rmdel	837
rmdir	838
rmf	839
rmm	841
rpcgen	843
rpcinfo	845
rstatd	847
runacct	848
runcat	852
rup	854
rusers	856
rusersd	858
rwall	859
rwalld	861
	862
sactsadc	863
	864
salsa2	864
	865
	867
	871
	874
	875
sdb	010

sdiff	. 883
secure	885
sed	. 887
send	. 893
sendmail	. 897
setdma	. 910
setmnt	. 910
sh	. 911
shell	. 913
shlib	. 938
	. 939
	. 942
	. 945
shutdown	. 946
	. 949
	. 951
sleep	. 952
slocal	. 954
sno	. 956
sort	. 958
sortm	. 965
sound	. 967
spell	. 969
spline	. 972
split	. 974
splp	. 975
spost	. 978
spray	
sprayd	. 983
stat	. 984
strip	1017
stty	1018
su	1026
sum	1020
sync	1029
sysck	1030
syslogd	1037
tab, untab	1040
tabs	
tail	1041
tapechk	1044
tar	1047
tbl	1048
	1053
	1056
	1058
	1060
termdef	1062

test	1004
tic	1067
time	1068
timex	1069
tlog	1071
tlogger	1072
	1074
toc	1074
dtoc	1075
ttoc	1075
vtoc	
touch	1077
tplot	1079
tput	1081
tr	1083
trace	1086
trcrpt	1091
trestop	1093
trcupdate	1094
trdiag	1097
true	1099
true	1100
tsh	1102
tsort	1104
ttt	1104
tty	1103
turnon	
tvi	1108
ugtable	1109
umask	1110
umount, unmount	1112
uname	1114
unget	1116
uniq	1118
units	1119
updatep	1122
inudocm	1125
inuupdt	1127
users, adduser	1129
uucpadm	1133
uucheck	1137
	1139
uucico	1141
uucleanup	1144
uucp	1145
Path Names Used with uucp	
Source and Destination File Names	1146
Permissions	1110
log	1149

uuname	115
uupick	115
File-Handling Options	1154
uusched	1156
uustat	1158
uuto	1162
uutry, Uutry, uukick	1164
uux	1166
uuxqt	1172
val	1172
varyoff	1177
varyon	1180
vc	
verify	1182
vi, vedit, view	1186
vmh	1187
vrm2rtfont	1203
vrmconfig	1205
wall	1206
	1208
watch	1209
wcwhat	1211
what	1213
	1215
	1219
whom	1222
write	1225
writesry	1230
wump	1231
xargs	1232
xdbx	1236
yacc	1237
ypbind	1239
ypcat	1241
ypinit	1243
ypmatch	1245
yppasswd	1247
yppasswdd	1249
yppoll	1251
yppushyppush	1252
ypset	1254
ypserv	1256
ypwhich	1258
ypxfrypxfr	1260
300	1262
4014	1264
450	1265

Appendix A.	AIX Device Table	1267
Appendix B.	Program Cross-Reference	1269
Appendix C.	Syntax Diagram Guide	1277
Appendix D.	Japanese Language Support	1287
Glossary		1291
Task Index	TA	SK-1
Index	IND	EX-1

# **Figures**

1.	SCCS Header Flags	44
2.	SID Determination 4	21
3.	Mailbox Commands	11
4.	Mail Editor Commands	17
5.	Binary Options	17
6	Valued Options	19
7	Palta Table Kaywanda	20
0	Delta Table Keywords	82
0.	Header Flag Keywords	83
9.	Other Keywords	84
.0.	Configuration Options	05
Ι.	tbl Column and Item Specifiers	54
2.	Configuration File Parameters	29
3.	AIX Standard Devices (Special Files)	60
	12	UO

# VOLUME 1

# How to Use the Commands

This section contains a description of:

- Command input and output
- File name substitution by the shell
- Syntax diagrams
- Command, flag, and parameter notation.

To help you determine which command you want to use, see "Task Index" on page TASK-1. To help you determine in which program a command is located, see Appendix B, "Program Cross-Reference" on page 1269.

# Command Input and Output

Many commands take their input from **standard input** and write their output to **standard output**. By default, standard input comes from the keyboard, and standard output goes to the display. It is important to remember this information as you read the command descriptions since they describe the default action. In this context, the verb **display** means "write to the standard output." Any command that reads standard input and writes to standard output can have its input or output redirected to a file and can be used in a **pipeline**, where the standard output of a previous command is directed to the standard input of the next command. For more information on pipelines, see "sh" on page 913.

There are a few commands that must have a file name supplied or that must read standard input. You can see what a particular command can read by looking at the syntax diagram at the beginning of the description of the command. For instructions on interpreting syntax diagrams, see "Syntax Diagrams" on page 5.

# File Name Substitution

When *file* is supplied as an argument to either a command or a flag, you can automatically produce a list of file name arguments by specifying a pattern for the shell to match with file names in a directory. Most characters in such a pattern match themselves, but you can also use some special pattern-matching characters in your pattern. These special characters are:

- \* Matches any string, including the null string.
- ? Matches any one character.
- [ . . . ] Matches any one of the characters enclosed in square brackets.
- [! . . . ] Matches any character **other than** one of the characters that follow the exclamation mark within square brackets.

Inside square brackets, a pair of characters separated by a - (minus) specifies a set of all characters that collate within the range of that pair, as defined by the variable **NLCTAB** or **NLFILE**, so that [a-dy] is equivalent to [abcdy] if only b and c collate between a and d.

Japanese Language Support Information

You can also use *character classes* inside square brackets by enclosing the character class name between a [: and a :] inside the square brackets. For example, [[:a]pha:]] matches any alphanumeric character. The character classes recognized are:

[:lower:] All lowercase letters.

All uppercase letters. [:upper:]

[:alpha:] All letters.

[:digit:] Digits 0 - 9.

[:alnum:] All letters and digits.

[:print:] All printable characters.

[:punct:] All punctuation characters.

Space, tab, form feed, or carriage return. [:space:]

[:jalpha:] SJIS Roman characters.

[:jdigit:] SJIS Arabic numerals.

[:jpunct:] SJIS punctuation characters.

[:jparen:] SJIS parentheses characters.

SJIS kanji characters. [:jkanji:]

[:jhira:] SJIS hiragana characters.

[:jkata:] SJIS and half-width katakana characters.

. End of Japanese Language Support Information

Using pattern-matching characters in file names on the command line has some restrictions. If the first character of a file name is a . (dot), it can be matched only by a pattern that begins with a dot. For example, \*file matches the file names myfile and yourfile, but not .myfile or .yourfile. Use the pattern .\*file to match these file names.

If a pattern does not match any file names, the pattern itself is returned as the result of the match.

Note: File and directory names should not contain the characters \*, ?, [, or ] because this may create infinite loops during pattern matching attempts.

# Syntax Diagrams

Before each command discussion in the "Commands" section is a syntax diagram. These diagrams are designed to provide information about how to enter the command on the command line. A syntax diagram can tell you:

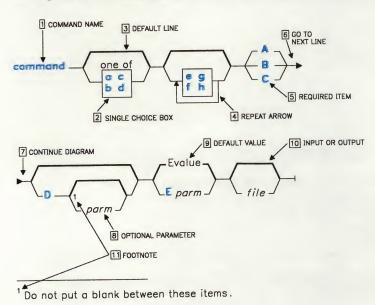
- Which flags can be entered on the command line
- Which flags must take parameters
- Which flags have optional parameters
- Default values of flags and parameters, if any
- Which flags can and cannot be entered together

- Where you must enter flags or parameters and where you have a choice
- Where you can repeat flag and parameter sequences.

This command reference uses the following conventions in the syntax diagrams:

- Diagram items that must be entered literally on the command line are in **bold**. These items include the command name, flags, and literal characters.
- Variable diagram items that must be replaced by a name are in *italics*. These items include parameters that follow flags and parameters that the command reads, such as *files* and *directories*.
- Default values that do not have to be entered are in the normal font on a **bold** path.

The following diagram is an example that illustrates the conventions used in the syntax diagrams. Each part of the diagram is labeled. An explanation of the labels follows the diagram.



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You interpret the diagram as follows:

1 COMMAND NAME

The first item in the diagram is the name of the command you want to invoke. It is in bold, so it must be entered exactly as it appears in the diagram.

After the command name, the path branches into two paths. You can follow either path.

2 SINGLE CHOICE BOX

If you follow the lower path, you encounter a box with the words one of over it. You can choose only one item from this box.

3	DF	FAU	IT	IT	NF
U	$\nu$ L	1 70		L 1	IN L

If you follow the upper path, you bypass the single choice box, and enter nothing. The bold line around the box is a default line, which means that you do not have to enter anything from that part of the diagram. Exceptions are usually explained under "Description." One important exception, the blank default line around input and output files, is explained in item 10.

#### 4 REPEAT ARROW

When you follow a path that takes you to a box with an arrow around it, you must choose at least one item from the box. Then you can either follow the arrow back around and continue to choose items from it, or you can continue along the path. When following the arrow around just the box (rather than an arrow that includes several branches in the diagram), do not choose the same item more than once.

## 5 REQUIRED ITEM

Following the branch with the repeat arrow is a branch with three choices and no default line around them. This means that you must choose one of A, B, or C.

#### 6 GO TO NEXT LINE

If a diagram is too long to fit on one line, this character tells you to go to the next line of the diagram to continue entering your command line. Remember, the diagram does not end until you reach the vertical mark.

## 7 CONTINUE DIAGRAM

This character shows you where to continue with the diagram after it breaks on the previous line.

## 8 OPTIONAL PARAMETER

If a flag can but does not have to take a parameter, the path branches after the flag. If you cannot enter a space between the flag and parameter, you are told in a footnote.

#### 9 DEFAULT VALUE

Often, a command has default values or actions that it will follow if you do not enter a specific item. These default values are indicated in normal font in the default line if they are equivalent to something you could enter on the command line (for example, a flag with a value). If the default is not something you can enter on the command line, it is not indicated in the diagram. However, it is discussed under "Flags."

**Note:** Default values are included in the diagram for your information. Do not enter them on the command line.

#### 10 INPUT OR OUTPUT

A command that can read either input files or standard input has an empty default line above the file parameter. If the command can write its output to either an output file or to standard output, it is also shown with an empty default line above the output file parameter. If a command can read only from standard input, an input file is not shown in the diagram, and standard input is assumed. If a command writes only to standard output, an output file is not shown in the diagram, and standard output is assumed. When you must supply a file name for input or output, the file parameter is included in the diagram without an empty default line above it.

11 FOOTNOTE

If a command has special requirements or restrictions, a footnote calls attention to these differences.

Following are examples of valid ways this command can be entered based on this syntax diagram.

```
command name A
command name C
command name a B
command name d B
command name e A
command name e G
command name c D
command name C D
command name C D8
command name A E7
command name B myfile
command name a e g B D3 E6 myfile
command name d f e h C D myfile
```

When the order of flags is important, it is indicated in the diagram, under "Flags," or in both places. Otherwise, the flags can be entered in any order. With this in mind, an additional example of how to enter this command is:

```
command name E9 a D g A h f myfile
```

For more detailed information on syntax diagrams, see Appendix C, "Syntax Diagram Guide" on page 1277.

# Command, Flag, and Parameter Notation

The following type style conventions are used in command descriptions to distinguish different kinds of information:

bold Commands, flags, and other items in bold are to be entered literally.

Command parameters, flag parameters, and other items in italics are items for which you substitute an appropriate value in that position on the command line. For example, if you see *file*, you should type in the name of a file in that position.

[] Items in brackets are optional. The only exception is brackets that are in bold. Brackets in bold are part of what should be entered literally.

. . . Items followed by an ellipsis can be repeated. Thus, if you see *file* . . . , you can type several file names separated by blanks.

Using these conventions, the following string:

-Dname[=value]

shows that, with the -D flag, the name parameter is required but assigning a value to name is optional. The following are valid ways to specify this flag and parameter combination:

-Daxis -Daxis=10

The next string shows a parameter that can be replaced by several values:

-1 file . . .

The following are valid ways to enter the -l flag:

- -1 memo letter
- -1 memo
- -1 letter

# Commands

This section contains reference information for the AIX commands. This information may include the purpose of a command, one or more syntax diagrams to illustrate how a command can be entered on a command line, a description of how a command works, descriptions of command flags and subcommands, a list of related files, and cross references to related information.